

## CLAIMS

1. A method of illuminating subjects to be imaged by a microwave, millimetre wave, sub-millimetre wave or infrared passive imaging system, comprising directing onto the subject to be imaged, the image or shadow of a cold source, i.e. a source with a low black body temperature, or of a hot source, i.e. a source with a black body temperature significantly higher than that of the subject to be imaged.
- 10 2. A method according to Claim 1 wherein said cold source or hot source is incorporated in said imaging system and uses at least part of the imaging system which is adapted to receive imaging radiation from the scene or subject being imaged to direct said image or shadow of the cold or hot source onto the scene or subject being imaged.
- 15 3. Imaging apparatus for passive microwave, millimetre wave, sub-millimetre wave or infrared imaging, including a receiver for microwave, millimetre wave or infrared radiation from the scene or subject being imaged, directing means for directing such radiation onto the receiver, a cold source or a hot source, i.e. a source with a low or high black body temperature, and means for directing the image or shadow of said cold source or hot source onto the scene or subject being imaged.
- 20 4. Apparatus according to Claim 3 wherein said directing means for directing radiation from the source or subject being imaged onto said receiver forms, at least in part, part of said means for directing said image or shadow from said cold source or hot source.

5. Apparatus according to Claim 4 wherein said image or shadow of said cold source or hot source is directed onto the scene or subject being imaged, and radiation from said scene or subject is directed onto said receiver, via a conventional circulator, or via a wire grid polariser and quarter wave reflector or transmitter in combination, or via a wire grid polariser and a Faraday rotator.

6. A method of illuminating subjects to be imaged by a microwave, millimetre wave, sub-millimetre wave or infrared passive imaging system, 10 substantially as hereinbefore described, with reference to Figure 1 or Figure 2 of the accompanying drawings.

7. Apparatus according to Claim 3 and substantially as hereinbefore described with reference to Figure 1 or Figure 2 of the accompanying drawings.

15 8. A method of illuminating an object by radiation in the microwave, millimetre wave, sub-millimetre wave or infrared ranges for imaging by an imaging device, comprising arranging a retroreflector facing the object and disposed laterally with respect of the line of sight between the object and the imaging device and directing such radiation onto the object, from a radiation source, along a path corresponding to or close to said line of sight, whereby light from said source, reflected laterally from the object, will be reflected, in turn, by the retroreflector, back substantially along the path which it followed from the object to the retroreflector, to be reflected in turn, by the 20 object, back to the imaging device.

25 9. A method according to Claim 8 wherein the retroreflector comprises a cube-corner reflective array.

10. A method according to Claim 8 wherein the retroreflector comprises a layer of transparent beads, spheres or lenses.

5 11. A method according to Claim 8 wherein the retroreflector comprises a cube-corner reflector array in combination with an array of converging lenses arranged over the corner array, each lens covering or substantially covering a respective cube-corner of the array.

10 12. A method according to any of Claims 8 to 11 wherein the imaging device is arranged to scan the object in a scanning raster and wherein the radiation from said source is directed onto the object in a beam which is caused to scan the object in a corresponding scanning raster such that the instantaneous path of the beam of said radiation from said source to the object 15 corresponds substantially to the instantaneous line of sight from the imaging device to the object.

13. Apparatus for illuminating and imaging an object in an object area by radiation in the microwave, millimetre wave, sub-millimetre wave or 20 infrared ranges, comprising an imaging device, a source of such radiation, a retroreflector arranged facing said object area and means for directing such radiation from the radiation source towards said object area along a path corresponding to the line of sight of the imaging device.

25 14. Apparatus according to Claim 13 wherein the retroreflector comprises a reflective cube-corner array.

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15. Apparatus according to Claim 13 wherein the retroreflector comprises a cube-corner reflective array in combination with an array of converging lenses arranged over the cube-corner array, each lens covering or substantially covering a respective cube-corner of the array.

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16. Apparatus according to any of Claims 13 to 15 wherein the imaging device is arranged to scan the object area in a scanning raster and said means for directing is arranged to direct a beam of such radiation, from said source, towards the object area and to scan the beam in corresponding raster over the object area, such that the instantaneous path of the beam of said radiation from said source to the object area corresponds substantially to the instantaneous light of sight from the imaging device to the object area.

17. *A method according to Claim 8 and substantially as hereinbefore described with reference to Figures 3 to 5 of the accompanying drawings.*

18. Apparatus according to Claim 13 and substantially as hereinbefore described with reference to and as shown in Figures 3 to 5 of the accompanying drawings.

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